

STRUCTURE OF THIS MICROCARD (BASIC INSTRUCTIONS)

A02 = How to use this microcard		1	2	3		4
A01 = Structure of microcard					SIS	
B01 = Trouble-shooting chart	A	***X*	X*XXX	XXXXX	XXXXX	*XXXX X
	B	*XXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	C	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	D	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	E	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XX
	F	XXXXX	XXXXX	XXXXX	XXX	
	G	XXXXX	XXXXX	XXXX		
	H					
	J					
	K					
	L					
	M					
N01 = Service information	N	*XXXX	XXXXX	XXXXX	XXX	*X XX*
		12345	67890	12345	67890	12345 678
			1		2	
						Index

N28 = Table of contents and publication information

- 1 = Special features
- 2 = Safety and precautionary measures
- 3 = Testers and tools
- 4 = Installation position of components

- a. Read from left to right.
- b. Title of micropicture (appears on each micropicture).

E16	Product/component/test step	
	Coordinate	

c. Limits of section

<u>==></u>	<u><==</u>	<u><==</u>	<u>=> <=</u>
Beginning	Mid-section	End	One-page section

A01		=> <=
-----	--	-------

HOW TO USE THIS MICROCARD

Trouble-shooting instructions for system:
Tire monitoring system (RKS-G)

Descriptions, photographs, terminal designations and special features refer to the following vehicle:

PORSCHE 928 08.88 ->

These basic instructions represent detailed trouble-shooting instructions. They are not to be used as vehicle-specific instructions. Important! Descriptions and photographs may differ from the vehicle-specific brief instructions.

Binding set values, terminal assignments and special features are to be taken only from the vehicle-specific brief instructions. For brief instructions refer to Contents Microcard KFZ-00..

A02		=> <=
-----	--	-------

SPECIAL FEATURES

The RKS-G consists of the following components:

- * Control unit (evaluation electronics)
- * Pressure switch 2 x per wheel
- * HF sensor 1 x per wheel

Functional description:

The RKS-G is used to monitor the tire pressure of the four wheels.

In the event of a pressure loss, this condition – which is of importance not only for driving safety but also for tire service life – is immediately indicated to the driver.

The indication is given on the instrument cluster on a dot matrix (vehicle simulation).

Tire pressure monitoring:

In the event of a tire pressure $> P_s$ the resonant circuit – which is contained in the pressure switch and which is geared to the frequency of the HF sensor – is closed and thus – with every revolution of the wheel – effects attenuation of the HF sensor whilst it is inductively connected to it. This leads to a brief increase in the power consumption of the HF sensor which is picked up by the control unit as an increase in current.

The signals from the HF sensors are compared to the wheel-speed-sensor signals of the ABS system and evaluated.

SPECIAL FEATURES (CONTINUED)

If the tire pressure P is less than or equal to the pressure in the pressure switch, the resonant circuit in the pressure switch is opened and there is no attenuation of the HF sensor. In this case the control unit does not receive an electrical pulse.

Evaluation of HF and wheel-speed sensor pulses:

System monitoring:

A system failure, i.e. a fault on the basis of which the tire pressure monitoring may even only be partially affected, is indicated to the driver.

In order to preclude starting influences, the system monitoring only becomes active following engine start (signal from oil pressure switch).

The system faults include all faults involving components of the RKS-G, as well as faults in the input/output signals and the operating voltage.

The following faults can be detected by the control unit:

Evaluation electronics:

- * Program sequence

HF sensor:

- * Deviation from the two normal operating statuses.
- * Short to ground or open circuit in lead.

P = Inflation pressure

P_s = Air pressure in pressure switch

SPECIAL FEATURES (CONTINUED)

Wheel-speed signals:

- * Deviation in number of pulses
- * Short to ground or open circuit in lead
- * Total failure (all 4 signals)
- * Loose contact

Interface to instrument cluster:

- * No prompt from instrument cluster

System lamp:

- * Short to ground or open circuit in lead
- * Lamp defective

Operating voltage:

- * Undervoltage

The faults indicated are stored and can be called up in the event of a fault.

Furthermore, there are system faults which are not recognized as such by the RKS-G.

Pressure switch:

- * Pressure in tire greater than in pressure switch (switch closed)
- * Pressure in tire equal to or less than in pressure switch (switch open)

SPECIAL FEATURES (CONTINUED)

Control unit:

- * Plug not attached
- * Voltage supply interrupted

Display in vehicle:

The following signal facilities are used for fault indication:

- * LCD panel in instrument cluster. Actuation via serial interface
- * Warning lamp in instrument cluster; actuated directly by control unit.

Indication of instrument cluster in the event of pressure loss:

Illuminated or flashing wheel arrows are used for fault assignment.

Wheel arrow flashes with

$$\begin{array}{l} P \leq P_{S2} \text{ and } v > 50 \text{ km/h} \\ \text{or } P \leq P_{S1} \text{ and } v \leq 50 \text{ km/h} \end{array}$$

Warning lamp lights up.

The fault output of the control unit to the instrument cluster is maintained until the ignition is switched off even if the fault is no longer present and then goes out on locking the door.

Indication of system faults:

System faults are indicated on a dot matrix on the instrument cluster. The system fault display is higher ranking than the pressure loss display. The display appears with a certain time delay following fault detection.

SPECIAL FEATURES (CONTINUED)

The following faults can be visualized with the ON-BOARD diagnosis in the vehicle on the instrument cluster.

Fault location	Type of fault	Code
Control unit	* Internal fault	17
HF sensor LF	* Level error	3
HF sensor RF	* Short to ground	4
HF sensor LR	* Short to positive	1
HF sensor RR		2
Wheel-speed signal LF	* No.of teeth wrong	7
Wheel-speed signal RF	* Open circuit	8
Wheel-speed signal LR		5
Wheel-speed signal RR		6
Interface (indication)	* Open circuit	18
System lamp	* Short to positive	9
	* Open circuit	
Operating voltage	* Undervoltage U _B < 8V	19

4 faults can be stored in the fault memory. If more than 4 faults occur, the first fault stored is cleared again.

SAFETY AND PRECAUTIONARY MEASURES

Pay particular attention to measures indicated to avoid damage to engine, control units and peripheral components of tire monitoring system.

The RKS-G is basically maintenance-free, however the following must be observed when performing work on vehicles fitted with RKS-G:

The entire RKS-G must be checked following replacement of the pressure switch, control unit, HF sensor and wiring harness and following work affecting the RKS-G (e.g. wheel change or accident repairs).

SAFETY AND PRECAUTIONARY MEASURES (CONTINUED)

Never start engine without battery securely connected (battery terminals tightened).
Do not disconnect battery from vehicle electrical system with engine running.

Do not use a fast charger for starting the engine.

Provide starting assistance only with second 12 V battery and jump leads.

Caution! Owing to non-standardized requirements of vehicle manufacturers with regard to electronic products, we advise against using a 24 V battery for starting assistance.

When charging the battery in the vehicle or providing starting assistance, follow the operating instructions for the fast charger as well as instructions of the vehicle manufacturer.

Disconnect battery from vehicle electrical system before charging or fast-charging.

Incorrect polarity of the supply voltage, e.g. through incorrect connection of the battery or ignition coil, may lead to the destruction of a control unit.

Do not connect or disconnect wiring-harness plugs from control units or trigger boxes with the ignition on.

Remove control units at temperatures above + 80° C (paint-drying installation).

Remove control units before carrying out electric welding work.

TESTERS AND TOOLS

Description	Designation	Part no.
Pocket system tester	KTS 300	0 684 400 300
Program module for KTS 300	PPG 204	1 687 023 067
Adapter lead for Porsche		1 684 465 192
Multimeter	MMD 301	0 684 500 301 or Fluke multimeter
Test cable set		1 687 011 208
Pin-type socket wrench for holding pressure switch		KDES 0013
Socket wrench for securing pressure switch		KDES 0014
Mounting sleeve for fitting O-ring		KDES 0015

INSTALLATION POSITION OF COMPONENTS

Removal and installation instructions

Front axle: (top picture)

Rear axle: similar

Pressure-switch removal:

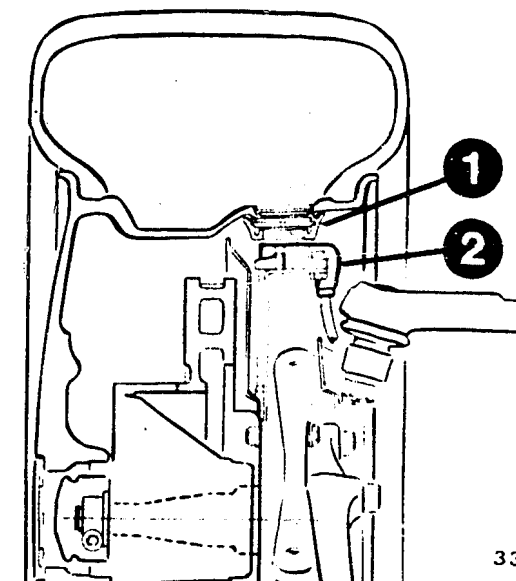
- * Remove tire and then remove deflector (arrow, bottom picture) over pressure switch.
Caution: When removing tire, do not position pressing-off device of tire-mounting device in area of pressure switches (press off with 90° offset).
- * Disassemble pressure switch using customer service tools KDES 0013 and KDES 0014.

The following is to be noted when installing a pressure switch:

- * Grease O-ring with vaseline.
- * O-ring is not to be pulled over sharp edges (threads, grooves, corners etc.). Only the mounting sleeve KDES 0015 is to be used for attaching the O-ring to the pressure switch. The O-ring must not be positioned in the mounting groove such that it is pinched or twisted.
- * Insert pressure switch in rim on correct side (see top picture).
Attach pin-type socket wrench KDES 0013 to pressure switch and hold it in position. Tighten fastening nut of pressure switch with socket wrench KDES 0014. Tightening torque 20...25 Nm.

HF - sensor disassembly:

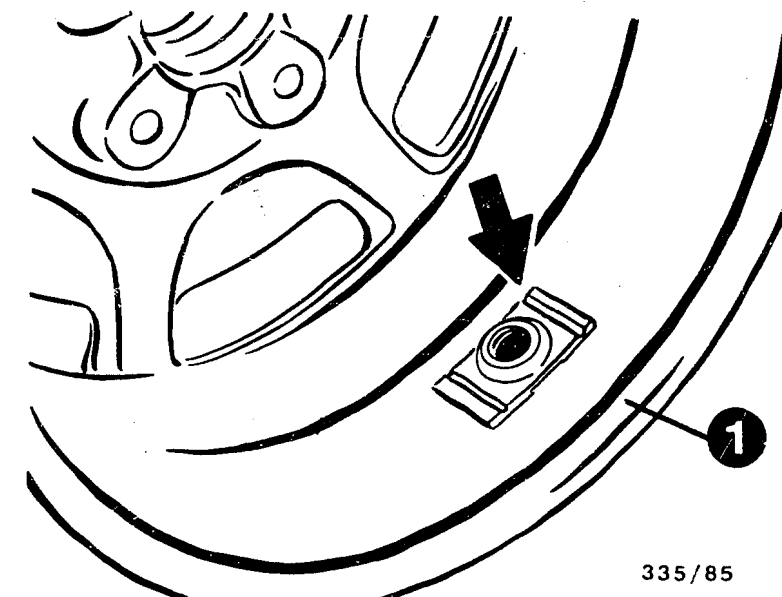
- * Loosen and remove two fastening screws.
- * Release triple plug connection and pull out HF sensor plug.
- * Install new HF-sensor in reverse order.



335/84

1 = Pressure switch
2 = HF sensor

Arrow = Deflector
1 = Rim

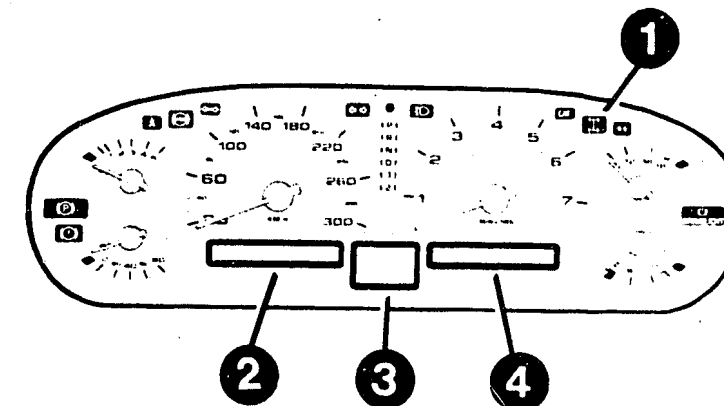


335/85

INSTALLATION POSITION OF COMPONENTS (CONTINUED)

Instrument cluster: top picture

- 1 = RKS-G warning lamp
- 2 = Left-hand display panel
- 3 = Center display panel (Pictogram)
- 4 = Right-hand display panel

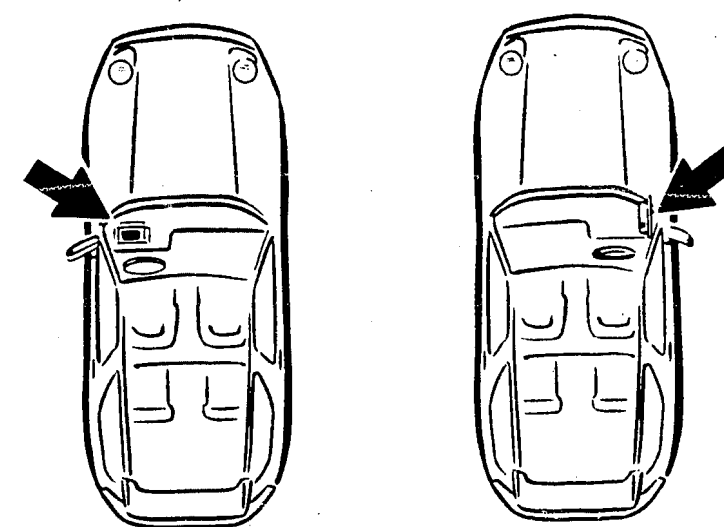


335 / 86

Control unit: Center picture

On LHD vehicles in driver's footwell at lower section of instrument panel, left.

On RHD vehicles in driver's footwell at right-hand side wall.

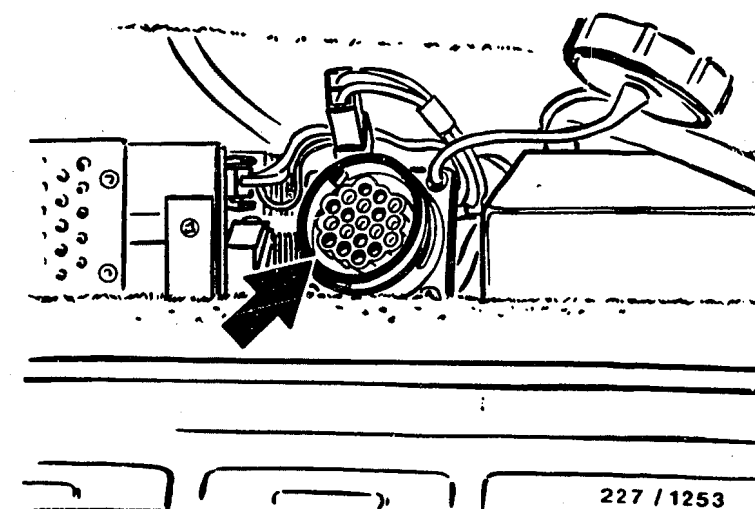


335 / 87

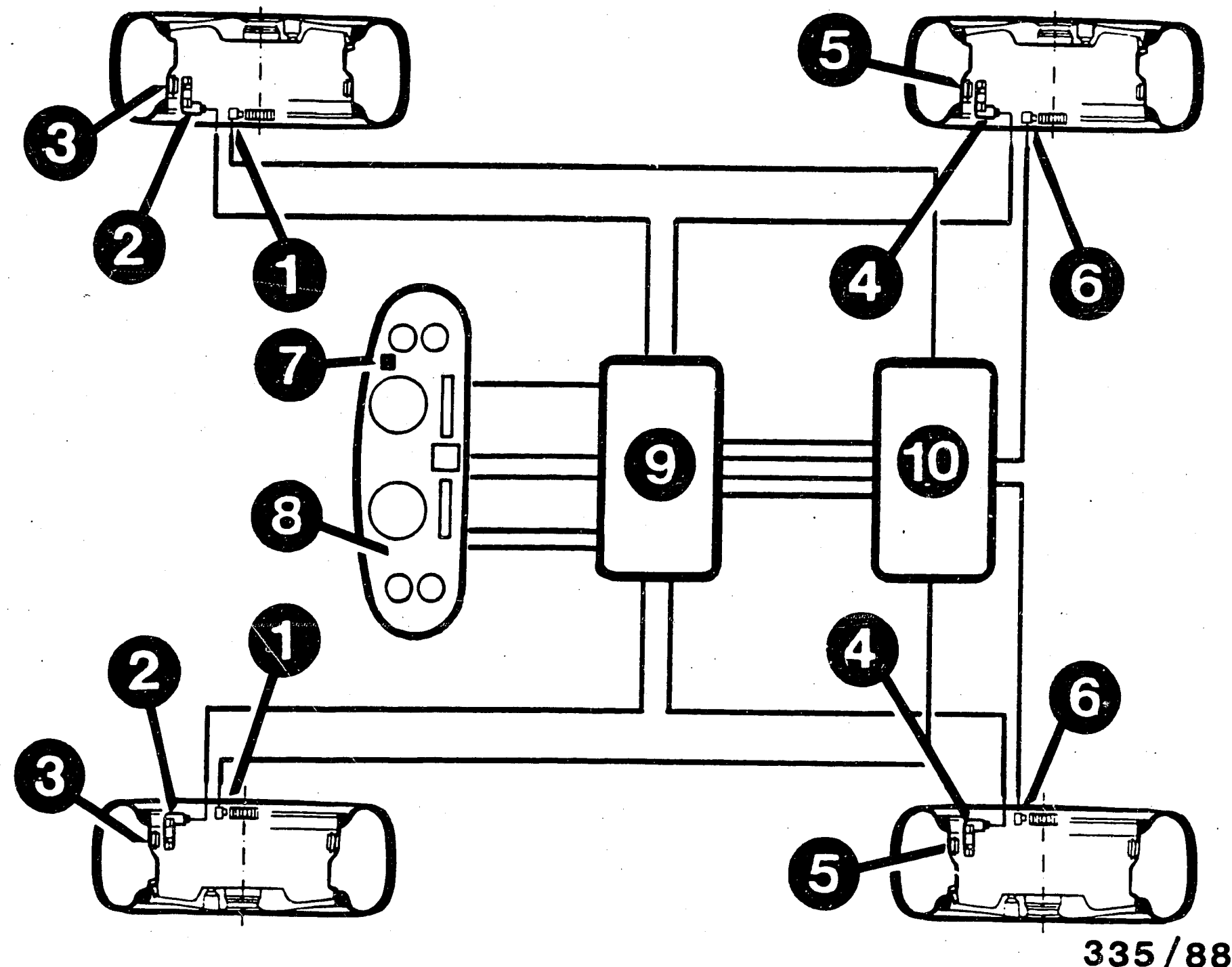
Diagnosis socket: bottom picture

On right next to passenger's seat beneath a cover.

Cover is secured with two knurled screws which can be unscrewed by hand.



227 / 1253



335/88

INSTALLATION POSITION OF COMPONENTS (CONTINUED)

- 1 = Wheel-speed sensor, front axle
- 2 = High-frequency sensor, front axle
- 3 = Pressure switch, front axle
- 4 = High-frequency sensor, rear axle
- 5 = Pressure switch, rear axle

- 6 = Wheel-speed sensor, rear axle
- 7 = Warning lamp
- 8 = Instrument cluster
- 9 = RKS-G control unit
- 10 = ABS controller

HOW TO USE TROUBLE-SHOOTING CHART AND TROUBLE-SHOOTING PROGRAM

The TROUBLE-SHOOTING CHART starts with Coordinate B04 and contains customer complaint (fault symptom/fault characteristic feature) together with several possible causes in each case (component faults) and coordinate information for detailed trouble-shooting. If no coordinates are given, this is because the causes concerned do not require any test instructions.

Components that are checked by the self-diagnosis or with the universal test adapter are not listed in the trouble-shooting chart.

In the event of a clearly established customer complaint, proceed consecutively and step by step as indicated in the trouble-shooting instructions in the stated sequence of possible causes.

Trouble-shooting should always be commenced with self-diagnosis (if provided) or with the universal test adapter (if possible). Only then should trouble-shooting be continued in line with the trouble-shooting chart.

In the event of a customer complaint which is not clear-cut, all causes indicated in the trouble-shooting chart must be tested. In order to avoid incorrect measurements, all causes are to be checked in the specified sequence (on account of the interdependence of test steps).

HOW TO USE TROUBLE-SHOOTING CHART AND TROUBLE-SHOOTING PROGRAM (CONTINUED)

The TROUBLE-SHOOTING PROGRAM contains all system and component tests indicated in the trouble-shooting chart. It is sub-divided into three rows of boxes.

The left-hand column contains test instructions and set values.

The center column contains information on trouble-shooting and fault elimination.

The right-hand column contains pictures/connection diagrams linked to the text together with explanatory notes.

If the questions posed in the left-hand column can definitely be answered with "yes", trouble-shooting is to be continued with the next box below.

If the answer to the question is "no", the center column must be applied and the tests performed in the sequence indicated there.

Following fault elimination, repeat test as a check.

TEST PREREQUISITES:

- Battery fully charged
- Engine in proper mechanical working order (e.g. compression, valve clearance etc.)
- Engine at operating temperature of approx. +80°C (if necessary)
- Proper connection of all connectors of wiring harness

- Vehicle ready for operation?
- Prescribed tire size fitted?
- Tire pressure O.K.?
- ABS system in proper working order.
- Correct pressure switches fitted in tire.
- Instrument cluster O.K.

TROUBLE-SHOOTING CHART

Customer complaint (fault symptoms)

1. RDK DEACTIVATED appears on display
2. Below 50 km/h TIRE PRESSURE appears on display with arrow at arbitrary wheel
3. Above 50 km/h TIRE PRESSURE LOSS appears on display with flashing arrow at arbitrary wheel
4. RDK DEACTIVATED appears sporadically.
5. Warning lamp (indicator lamp) lights up continuously
6. Warning lamp lights up sporadically.

Cause (component fault)						Coord.
X	X	X	X	X	X	Self-diagnosis B05
X				X		Control unit defective B16
X				X		Wheel-speed sensor C01
X		X		X		High-frequency sensor B21
X		X		X		Pressure switch B09
X				X	X	Interface, instrument cluster C11
X				X		Warning lamp defective C09
	X	X				Tire pressure too low B09
X	X	X	X	X	X	Read fault memory B07/ B11

HOW TO USE SELF-DIAGNOSIS, SELF-DIAGNOSIS
TEST TABLE AND TROUBLE-SHOOTING PROGRAM

This vehicle is equipped with a control unit which has a self-diagnosis feature. Therefore, start trouble-shooting with the self-diagnosis.

How to activate the self-diagnosis is described starting on Coordinate B07. The self-diagnosis test table starting on Coordinate B15 contains:

- Fault indication (flashing code)
- Components or system functions under test
- Test instructions/test conditions
- Connection terminals
- Set-value specifications
- Coordinate references for trouble-shooting and fault rectification in the subsequent self-diagnosis trouble-shooting program.

HOW TO USE SELF-DIAGNOSIS, SELF-DIAGNOSIS TEST TABLE AND
SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (CONTINUED)

The self-diagnosis trouble-shooting program is split up into 3 columns as of Coordinate B15.

The left-hand column contains test instructions and set values.

The center column contains information on trouble-shooting and fault elimination.

The right-hand column contains pictures/terminal diagrams belonging to the text together with explanatory notes.

If the questions posed in the left-hand column can definitely be answered with "yes", trouble-shooting is to be continued with the next box below.

If the answer to the question is "no", the center column must be employed and the tests performed in the sequence indicated there.

If the self-diagnosis indicates a fault, but there is no system or component fault, the control unit is to be replaced.

If no further system-specific faults are indicated by the self-diagnosis and the customer complaint (fault symptom) has still not been eliminated, trouble-shooting must be continued with the trouble-shooting chart as of Coordinate B04.

SELF-DIAGNOSIS

The RDK warning lamp lights up if a fault occurs in the system during operation. The fault is displayed in two warning stages on a pictogram in the center of the instrument cluster.

1st stage: constant lighting of wheel arrow in pictogram.

2nd stage: flashing of wheel arrow in pictogram.

The corresponding fault code is stored in the control unit and is retained even if the supply voltage is disconnected or – in the case of intermittent faults such as loose contacts – if the fault is no longer having an effect.

ACTIVATION OF SELF-DIAGNOSIS:

- * The fault memory can be read out with the pocket system tester KTS 300 (0 684 400 300) with program module PPG 204 as of status 25.09.1989■.

Note:

Further diagnosis possibilities (actuator diagnosis etc.), which would be possible with more recent program module statuses, are not evaluated with these vehicles.

Pay attention to operating instructions for KTS 300.

KTS 300 is connected by way of adapter lead 1 684 465 192 for Porsche to diagnosis socket in vehicle.

- * As an alternative to the KTS 300, the fault memory can be read out with ON-BOARD diagnosis. With ON-BOARD DIAGNOSIS, RKS-G does not appear, but rather the Porsche designation RDK.


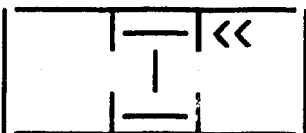
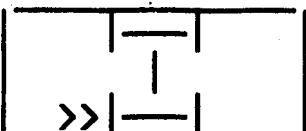

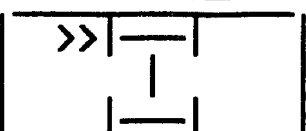
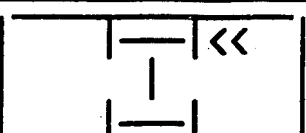
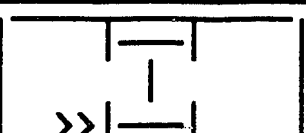
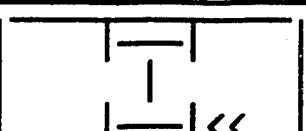

I M P O R T A N T :

The self-diagnosis test table for the pocket system tester can only be used as of control-unit version R 02.

The version is indicated in the center display field after calling up the ON-BOARD diagnosis.

Both the control-unit version R 00 and R 02 may appear in the self-diagnosis test table for ON-BOARD diagnosis. This has no influence on the test specifications.

Version R..

Fault indication on instrument cluster			Test instructions/test conditions	
TIRE		PRESSURE	FL arrow lights up all the time	A wheel arrow lights up all the time if a pressure switch indicates a tire pressure loss. Increase tire pressure by approx. 200 mbar. Increase pressure at other tire on same axle to same value. The display must go out following brief check drive (at least 20 m) at > 5 km/h.
TIRE		PRESSURE	FR arrow lights up all the time	
TIRE		PRESSURE	RL arrow lights up all the time	
TIRE		PRESSURE	RR arrow lights up all the time	
TIRE		PRESSURE LOSS	FL arrow flashes	If arrow flashes, proceed in exactly the same manner as when arrow lights up constantly. Repeat process until alarm is no longer given. A tire pressure of max. 3.5 bar at the front axle and 4.0 bar at the rear axle must not be exceeded. If the display does not go out, release air at both pressure switches until display RDK DEACTIVATED appears.
TIRE		PRESSURE LOSS	FR arrow flashes	
TIRE		PRESSURE LOSS	RL arrow flashes	
TIRE		PRESSURE LOSS	RR arrow flashes	
RDK		DEACTIVATED	Read and evaluate fault memory	

SELF-DIAGNOSIS (CONTINUED)

HOW TO USE SELF-DIAGNOSIS, SELF-DIAGNOSIS TEST TABLE AND TROUBLE-SHOOTING PROGRAM

For fault readout, use is made as indicator of the instrument cluster for "on-board diagnosis".

The instrument cluster can be set to the diagnosis mode as follows.

- * Switch on ignition
- * Establish link between pin 5 and pin 13 in diagnosis socket by means of short-circuit plug (only available from Porsche), or using a connecting lead provided at either end with a 2.5 mm AMP pin contact (bottom picture).
- * Press left-hand steering-column lever for 2 seconds.

The following message appears on the display in the instrument cluster

| PORSCHE | | | | DIAGNOSIS |

- * Further switching of the display is effected by pressing the steering-column switch "up".

The letter "R" stands for "Tire-pressure monitoring system".

| PORSCHE | | R | | DIAGNOSIS |

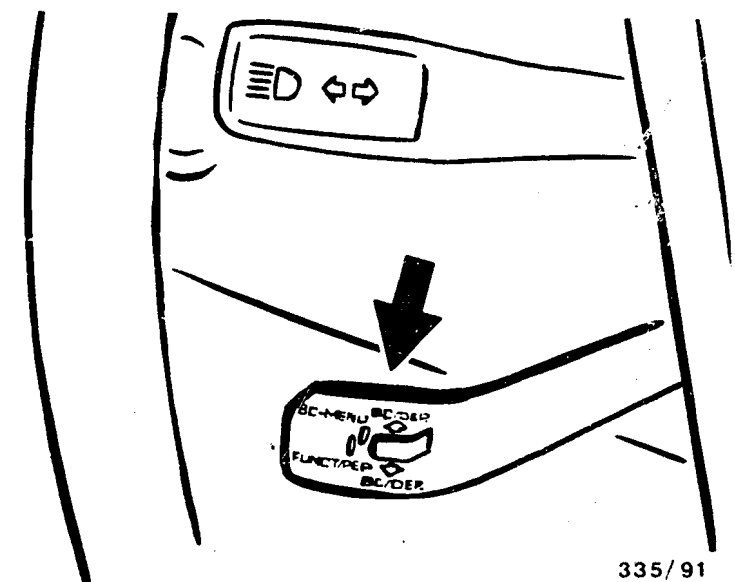
- * Stimulation of the L-lead is initiated by pulling the steering-column switch (top picture).

| RDK | | R.. | | DIAGNOSIS |

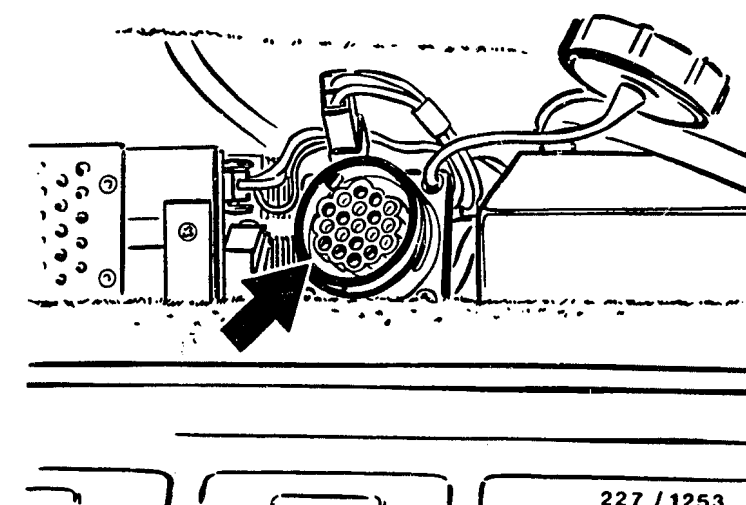
- * Pull steering-column switch.

| READ | | R.. | | DIAGNOSIS |

- * If yes, pull steering-column lever.



335/91



227 / 1253

| B11 | | | | <=> |

| B12 | | | | <=> |

SELF-DIAGNOSIS (CONTINUED)

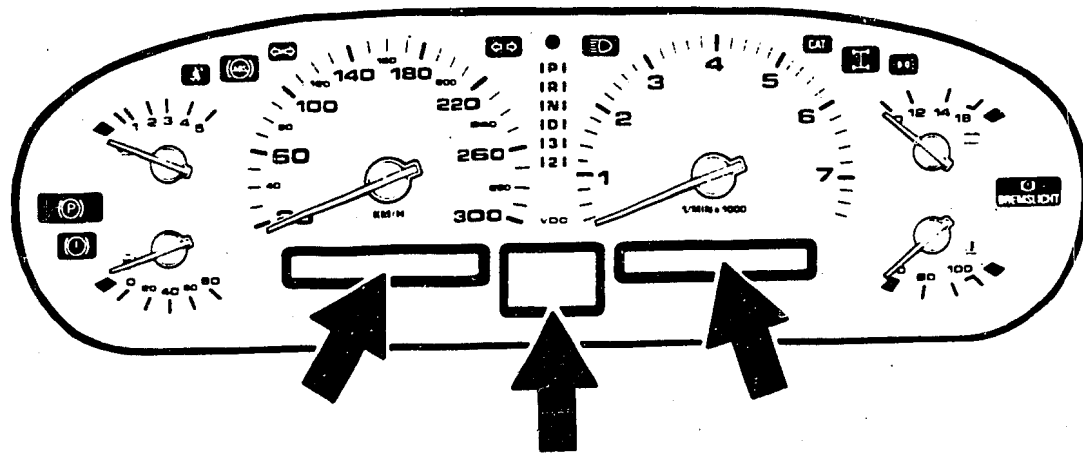
CLEARING FAULT MEMORY

The fault memory can be cleared using the pocket system tester with the instruction "Clear fault memory" or by way of the steering-column switch.

Clearing fault memory by way of steering-column switch:

Press steering-column switch DOWN for approx. 1 second.

A maximum of 4 faults can be stored in the fault memory.



335/86/1

SELF-DIAGNOSIS (CONTINUED)

SELF-DIAGNOSIS, SELF-DIAGNOSIS TEST TABLE AND TROUBLE-SHOOTING PROGRAM (CONTINUED)

The first stored fault (if present) now appears on the display (top picture).

(e.g.)

FAULT 01

R..

01/100

= HF sensor

Pull steering-column lever. The following now appears on the display if no further fault is stored

CLEAR

R..

MEMORY

SELF-DIAGNOSIS TEST TABLE

Fault ind. on instr. cluster			Component	Coordinate
	Version	Fault code		
Fault ..	R ..	01/104 01/ 40 01/ 98 01/ 34 01/100 01/ 36	High-frequency sensor LR	B21
Fault ..	R ..	02/104 02/ 40 02/ 98 02/ 34 02/100 02/ 36	High-frequency sensor RR	B23
Fault ..	R ..	03/104 03/ 40 03/ 98 03/ 34 03/100 03/ 36	High-frequency sensor FL	B25
Fault ..	R ..	04/104 04/ 40 04/ 98 04/ 34 04/100 04/ 36	High-frequency sensor FR	B27
Fault ..	R ..	05/104 05/ 40 05/100 05/ 36	Wheel-speed sensor RL	C01

SELF-DIAGNOSIS TEST TABLE (CONTINUED)

Fault ind. on instr. cluster			Component	Coordinate
	Version	Fault code		
Fault ..	R ..	06/104 06/ 40 06/100 06/ 36	Wheel-speed sensor RR	C03
Fault ..	R ..	07/104 07/ 40 07/100 07/ 36	Wheel-speed sensor LF	C05
Fault ..	R ..	08/104 08/ 40 08/100 08/ 36	Wheel-speed sensor RF	C07
Fault ..	R ..	09/ 97 09/ 33 09/100 09/ 36	Warning lamp	C09
Fault ..	R ..	17/ 00	Control unit	—
Fault ..	R ..	18/100 18/ 36	Serial interface	C11
Fault ..	R ..	19/ 00	Voltage supply	C13

SELF-DIAGNOSIS TEST TABLE (CONTINUED)

Pocket system tester Fault indication	Fault code	Coordinate
High-frequency sensor rear left Ground short	1	B21
High-frequency sensor rear right Ground short	2	B23
High-frequency sensor front left Ground short	3	B25
High-frequency sensor front right Ground short	4	B27
High-frequency sensor rear left Op. circ./sh. to B+	1	B21
High-frequency sensor rear right Op. circ./sh. to B+	2	B23
High-frequency sensor front left Op. circ./sh. to B+	3	B25
High-frequency sensor front right Op. circ./sh. to B+	4	B27

SELF-DIAGNOSIS TEST TABLE (CONTINUED)

Pocket system tester Fault indication	Fault code	Coordinate
High-frequency sensor rear left Signal error	1	B21
High-frequency sensor rear right Signal error	2	B23
High-frequency sensor front left Signal error	3	B25
High-frequency sensor front right Signal error	4	B27
Wheel-speed sensor rear left Open circuit	5	C01
Wheel-speed sensor rear right Open circuit	6	C03
Wheel-speed sensor front left Open circuit	7	C05
Wheel-speed sensor front right Open circuit	8	C07

SELF-DIAGNOSIS TEST TABLE (CONTINUED)

Pocket system tester Fault indication	Fault code	Coordinate
Wheel-speed sensor rear left Signal error	5	C01
Wheel-speed sensor rear right Signal error	6	C03
Wheel-speed sensor front left Signal error	7	C05
Wheel-speed sensor front right Signal error	8	C07
Warning lamp Short to B+	9	C09
Warning lamp Open circuit	9	C09
Control unit Digital sec.(comput) defective	17	—
Interface Instrument cluster defective	18	C11
Battery voltage too low	19	C13

For production reasons:
continued on the following
coordinate.

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (1)

V

Fault code 01/104, 01/ 40
01/ 98, 01/ 34
01/100, 01/ 36

N>

Test high-frequency sensor LR:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

- Select sensor 01
Note down indicated value.
- Select sensor 10
Note down indicated value.

Divide value from sensor 01 by value from sensor 10.

Set value: 88...94 %
64...74 %

Is set value attained?

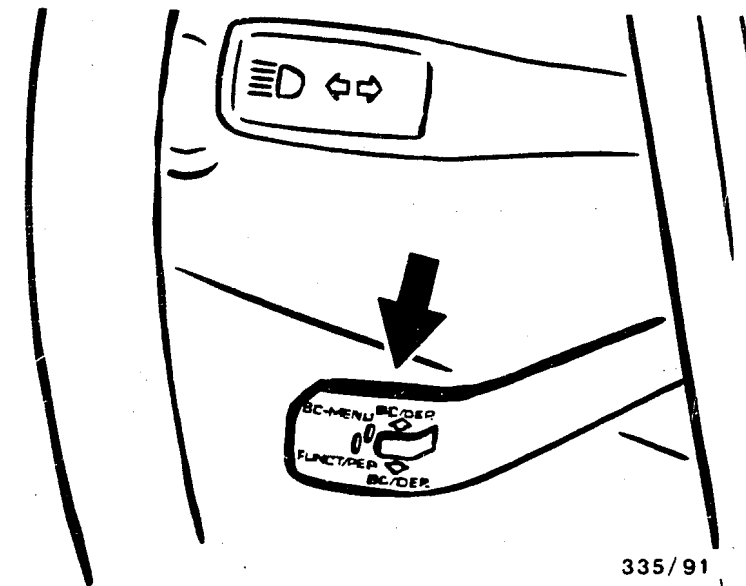
V

Continued on next picture page

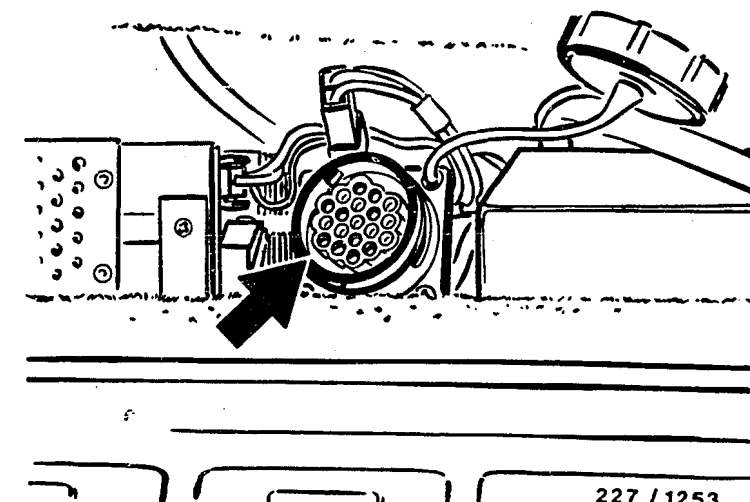
Trouble-shooting, high-frequency sensor LR

1. Value less than 10 % :
Short to ground in high-frequency sensor lead
- * Use ohmmeter to take measurement from control-unit plug term. 18 to vehicle ground.
Set value less than 10 Ω
2. Value greater than 94 % :
Open circuit in high-frequency-sensor lead
- * Use ohmmeter to measure leads for open circuit.
Set value approx. 0 Ω
3. Value 10...64 %
or 76...88 %
- * Electrical defect in high-frequency sensor.

Replace defective high-frequency sensor and repeat test step.



335/91



227 / 1253

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (2)

V

Fault code 02/104, 02/ 40
02/ 98, 02/ 34
02/100, 02/ 36

N>

Test high-frequency sensor RR:

* Call up diagnosis mode

- Switch on ignition.
 - Connect pin 5 and pin 13 at diagnosis socket.
 - Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
 - Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
 - Pull steering-column switch; display indicates RDK R.. DIAGNOSIS
- Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

- Select sensor 02
Note down indicated value.
- Select sensor 10
Note down indicated value.

Divide value from sensor 02 by value from sensor 10.

Set value: 88...94 %
64...74 %

Is set value attained?

V

Continued on next picture page

Trouble-shooting, high-frequency sensor RR

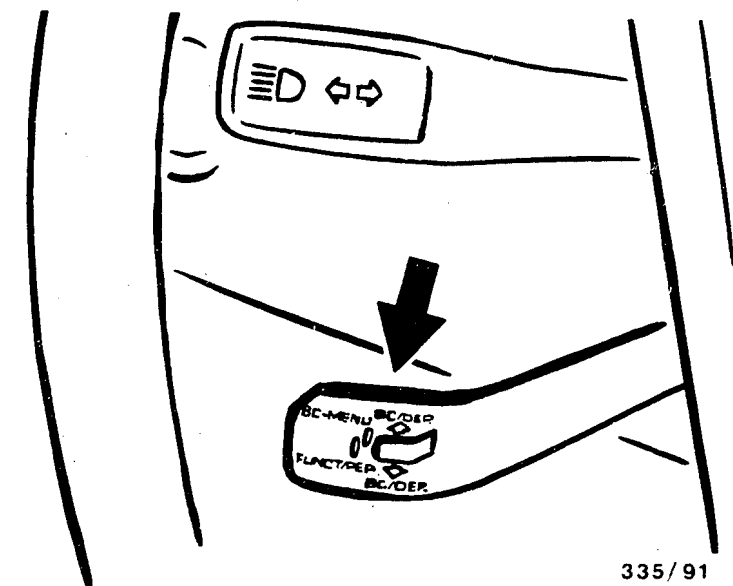
1. Value less than 10 % :
Short to ground in high-frequency sensor lead

* Use ohmmeter to take measurement from control-unit plug term. 35 to vehicle ground.
Set value less than 10 Ω
2. Value greater than 94 % :
Open circuit in high-frequency-sensor lead

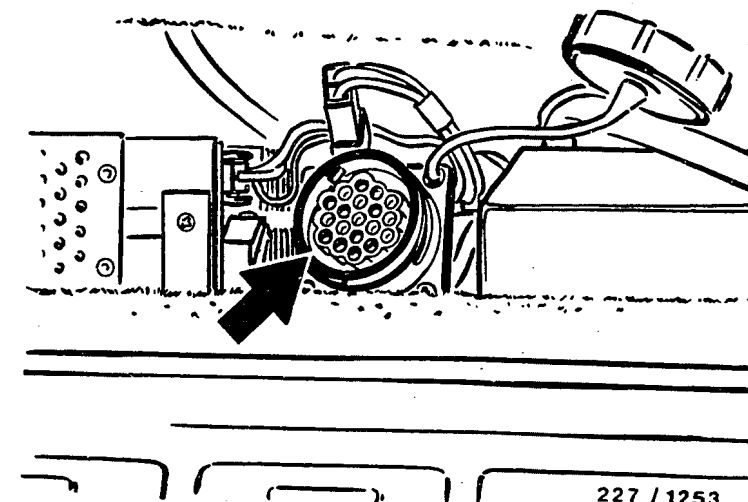
* Use ohmmeter to measure leads for open circuit.
Set value approx. 0 Ω
3. Value 10...64 %
or 76...88 %

* Electrical defect in high-frequency sensor.

Replace defective high-frequency sensor and repeat test step.



335/91



227 / 1253

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (3)

Fault code 03/104, 03/ 40
03/ 98, 03/ 34
03/100, 03/ 36

N>

Test high-frequency sensor LF:

* Call up diagnosis mode

- Switch on ignition.
 - Connect pin 5 and pin 13 at diagnosis socket.
 - Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
 - Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
 - Pull steering-column switch; display indicates RDK R., DIAGNOSIS
- Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

- Select sensor 03
Note down indicated value.
- Select sensor 10
Note down indicated value.

Divide value from sensor 03 by value from sensor 10.

Set value: 88...94 %
64...74 %

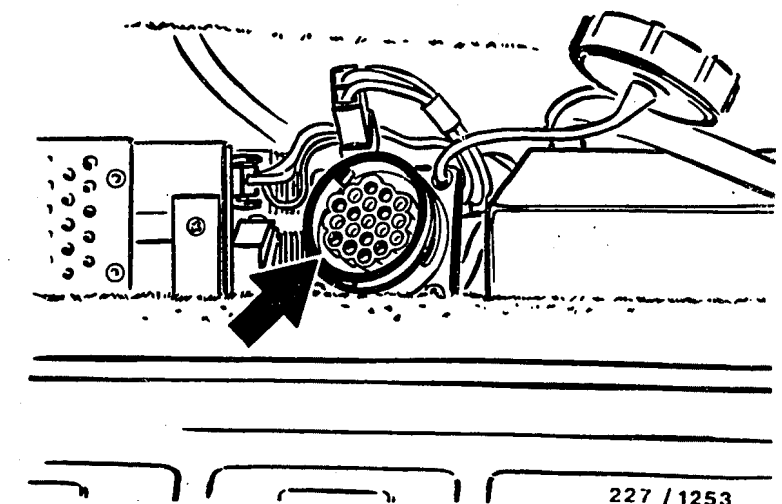
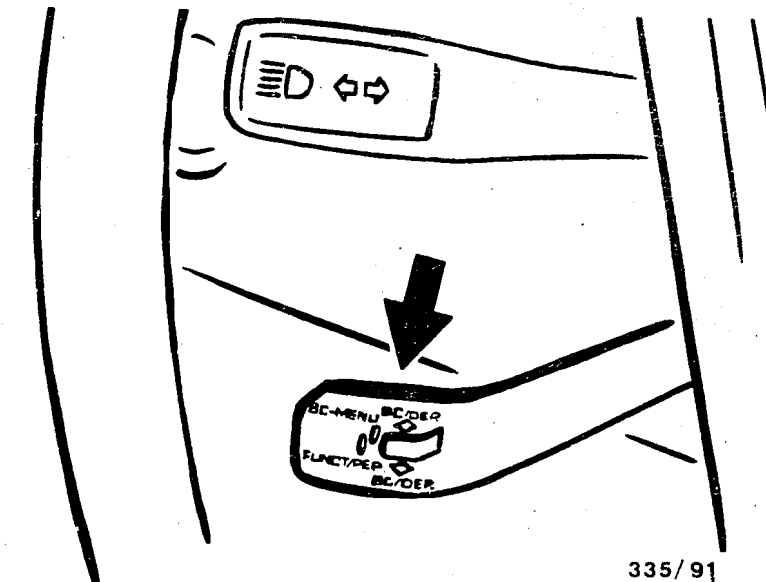
Is set value attained?

Trouble-shooting, high-frequency sensor LF

1. Value less than 10 % :
Short to ground in high-frequency sensor lead
- * Use ohmmeter to take measurement from control-unit plug term. 34 to vehicle ground.
Set value less than 10 Ω
2. Value greater than 94 % :
Open circuit in high-frequency-sensor lead
- * Use ohmmeter to measure leads for open circuit.
Set value approx. 0 Ω
3. Value 10...64 %
or 76...88 %
- * Electrical defect in high-frequency sensor.

Replace defective high-frequency sensor and repeat test step.

Continued on next picture page



SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (4)

Fault code 04/104, 04/ 40
04/ 98, 04/ 34
04/100, 04/ 36

N>

Test high-frequency sensor RF:

* Call up diagnosis mode

- Switch on ignition.
 - Connect pin 5 and pin 13 at diagnosis socket.
 - Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
 - Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
 - Pull steering-column switch; display indicates RDK R.. DIAGNOSIS
- Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

- Select sensor 04
Note down indicated value.
- Select sensor 10
Note down indicated value.

Divide value from sensor 04 by value from sensor 10.

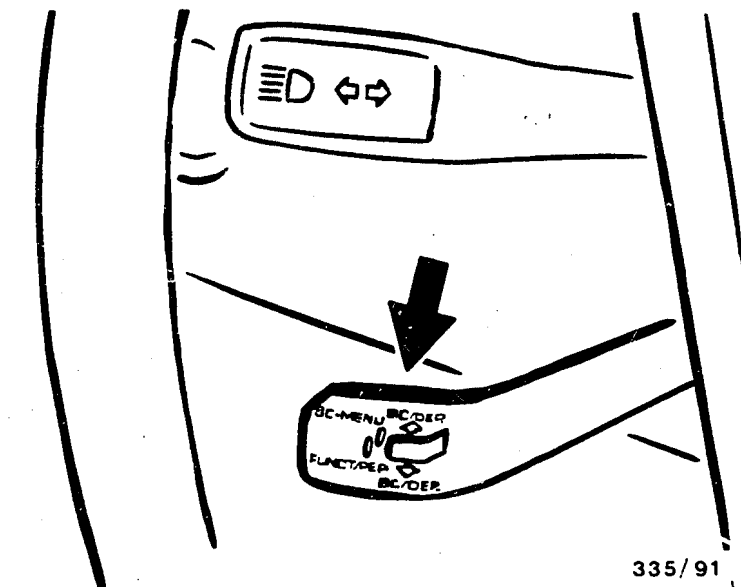
Set value: 88...94 %
64...74 %

Is set value attained?

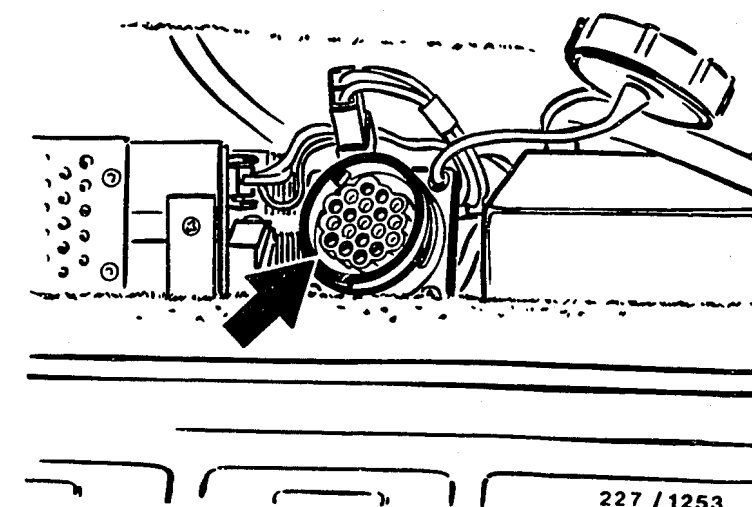
Trouble-shooting, high-frequency sensor RF

1. Value less than 10 % :
Short to ground in high-frequency sensor lead
- * Use ohmmeter to take measurement from control-unit plug term. 17 to vehicle ground.
Set value less than 10 Ω
2. Value greater than 94 % :
Open circuit in high-frequency-sensor lead
- * Use ohmmeter to measure leads for open circuit.
Set value approx. 0 Ω
3. Value 10...64 %
or 76...88 %
- * Electrical defect in high-frequency sensor.

Replace defective high-frequency sensor and repeat test step.



335/91



227 / 1253

Continued on next picture page

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (5)

Fault code 05/104, 05/ 40
05/100, 05/ 36

N>

Test wheel-speed sensor LR:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

* Select sensor 05

* Drive vehicle at 10 km/h

Set value:
Indication on display 7...9

Is set value attained?

Trouble-shooting, wheel-speed sensor LR

1. Value equal to 0:

- * Use ohmmeter to test lead from control-unit plug for ABS term. 12 (30) to control-unit plug RKS-G term. 25 for open circuit.

* Test ABS system with LED 2 tester (wheel-speed signal).

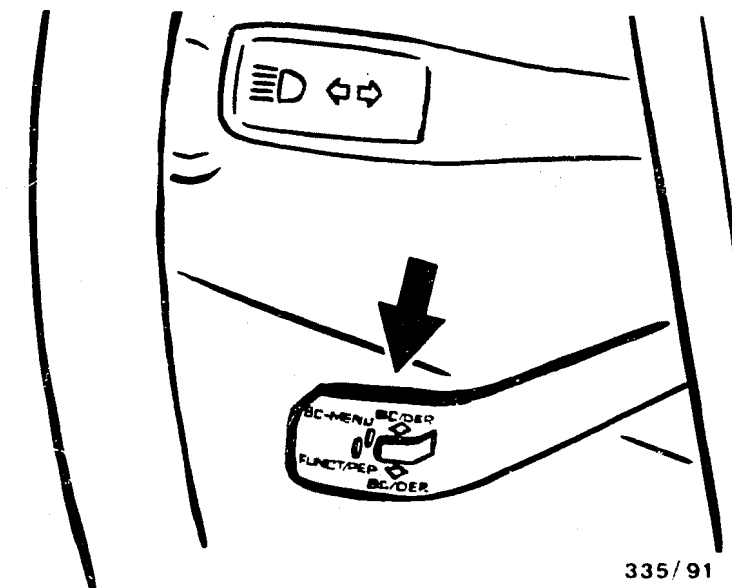
2. Value less than 7 greater than 9:

- * Wrong number of teeth
- * Ring gear loose
- * Check and repair ABS system.

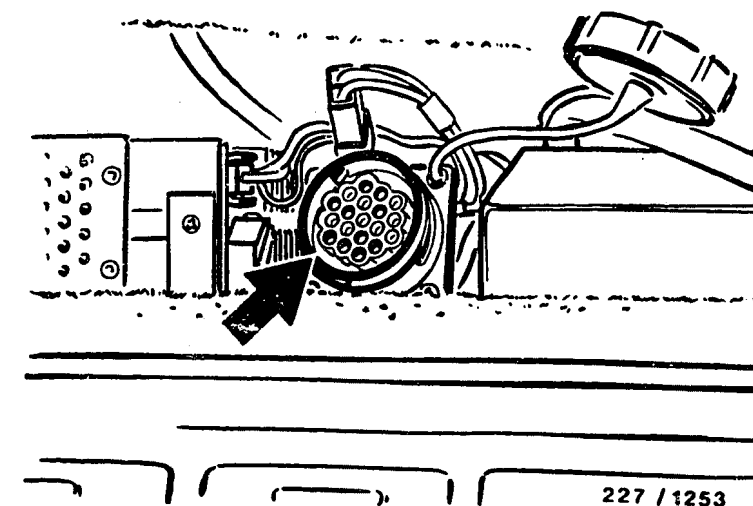
Terminal number in brackets applies to 35-pole ABS plug

Repeat test step to following repair.

Continued on next picture page



335/91



227 / 1253

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (6)

Fault code 06/104, 06/ 40
06/100, 06/ 36

N>

Test wheel-speed sensor RR:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

* Select sensor 06

* Drive vehicle at 10 km/h

Set value:
Indication on display 7...9

Is set value attained?

Trouble-shooting, wheel-speed sensor RR

1. Value equal to 0:

- * Use ohmmeter to test lead from control-unit plug for ABS term. 10 (31) to control-unit plug RKS-G term. 8 for open circuit.

* Test ABS system with LED 2 tester (wheel-speed signal).

2. Value less than 7
greater than 9:

- * Wrong number of teeth
- * Ring gear loose
- * Check and repair ABS system.

Terminal number in brackets applies to 35-pole ABS plug

Repeat test step to following repair.

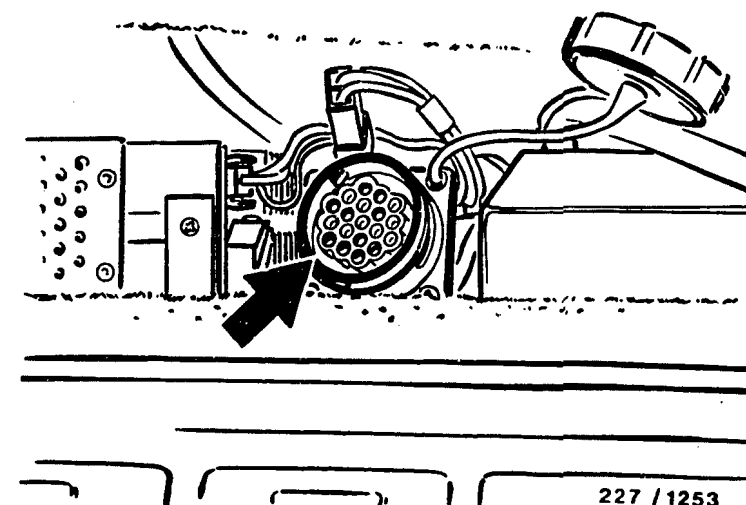
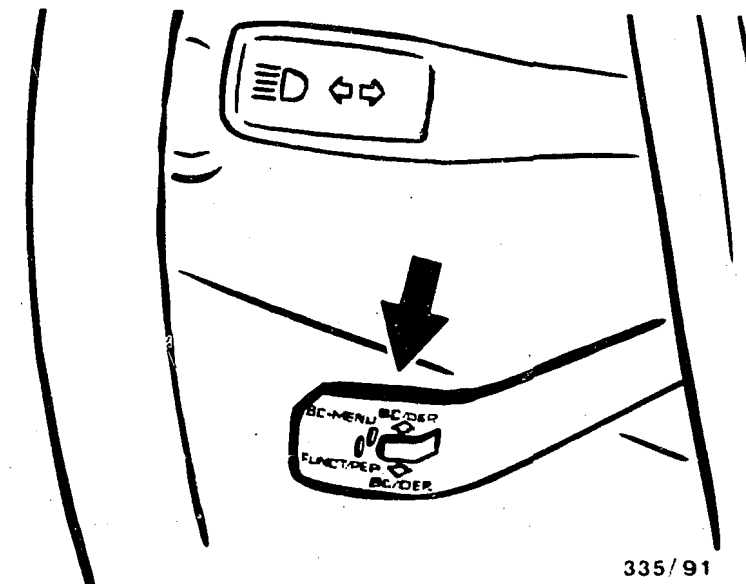
Continued on next picture page

C03

<=>

C04

227 / 1253



SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (7)

Fault code 07/104, 07/ 40
07/100, 07/ 36

N>

Test wheel-speed sensor LF:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

* Select sensor 07

* Drive vehicle at 10 km/h

Set value:
Indication on display 7...9

Is set value attained?

Trouble-shooting, wheel-speed sensor LF

1. Value equal to 0:

- * Use ohmmeter to test lead from control-unit plug for ABS term. 16 (17) to control-unit plug RKS-G term. 29 for open circuit.

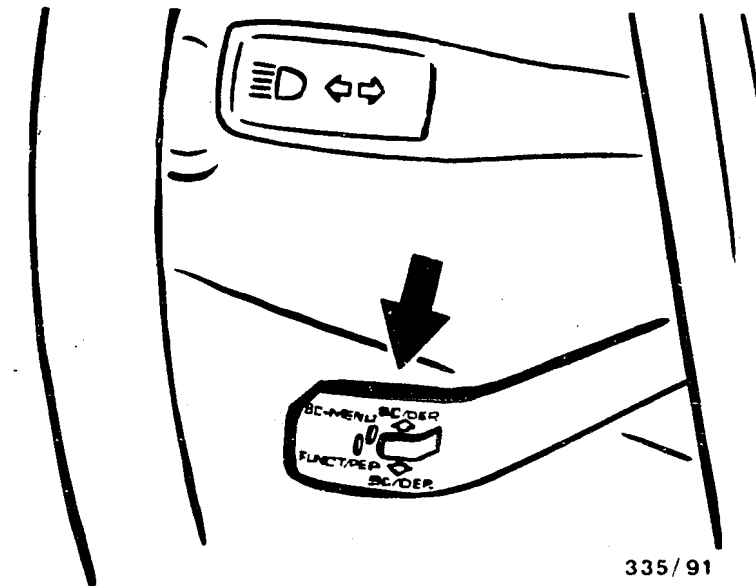
* Test ABS system with LED 2 tester (wheel-speed signal).

2. Value less than 7 greater than 9:

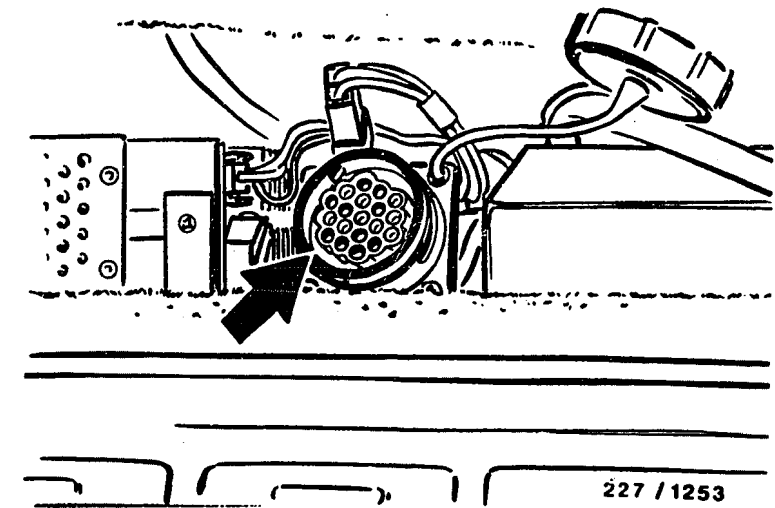
- * Wrong number of teeth
- * Ring gear loose
- * Check and repair ABS system.

Terminal number in brackets applies to 35-pole ABS plug

Repeat test step to following repair.



335/91



227 / 1253

Continued on next picture page

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (8)

V

Fault code 08/104, 08/ 40
08/100, 08/ 36

N>

Test wheel-speed sensor RF:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

* Select sensor 08

* Drive vehicle at 10 km/h

Set value:
Indication on display 7...9

Is set value attained?

V

Continued on next picture page

Trouble-shooting, wheel-speed sensor RF

1. Value equal to 0:

- * Use ohmmeter to test lead from control-unit plug for ABS term. 53 (23) to control-unit plug RKS-G term. 28 for open circuit.

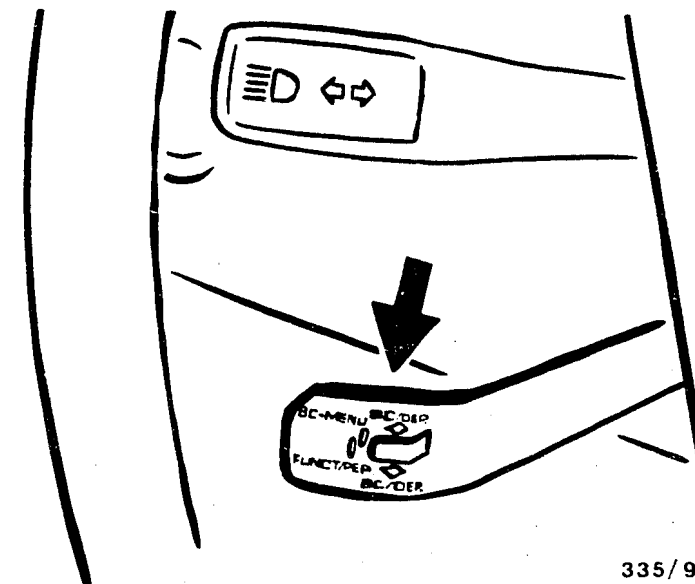
* Test ABS system with LED 2 tester (wheel-speed signal).

2. Value less than 7 greater than 9:

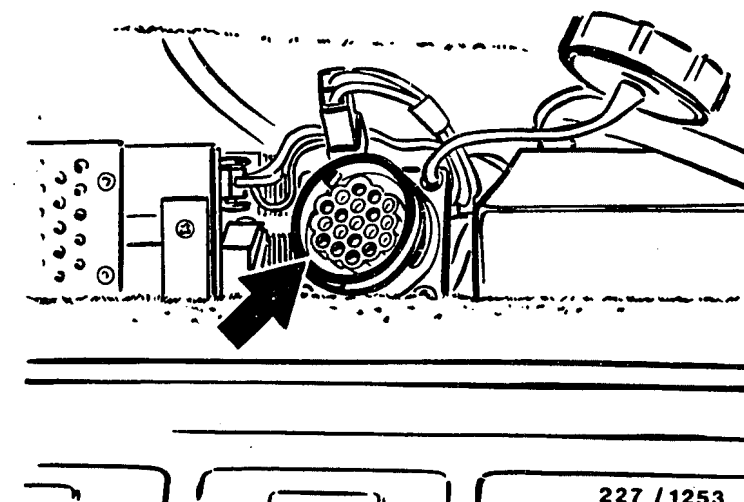
- * Wrong number of teeth
- * Ring gear loose
- * Check and repair ABS system.

Terminal number in brackets applies to 35-pole ABS plug

Repeat test step to following repair.



335/91



227 / 1253

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (9)

Fault code 09/ 97, 09/ 33
09/100, 09/ 36

Test warning lamp:

* Call up diagnosis mode

- Switch on ignition.
- Connect pin 5 and pin 13 at diagnosis socket.
- Press left-hand steering-column lever for 2 seconds. Display indicates PORSCHE DIAGNOSIS:
- Move steering-column switch up as often as is required to cause PORSCHE R DIAGNOSIS to appear.
- Pull steering-column switch; display indicates RDK R.. DIAGNOSIS

Further switching of the display is effected by pressing the steering-column switch up.

* Call up sensor test

* Select sensor 11

Set value:

Warning lamp on 0... 3

Warning lamp off 250...255

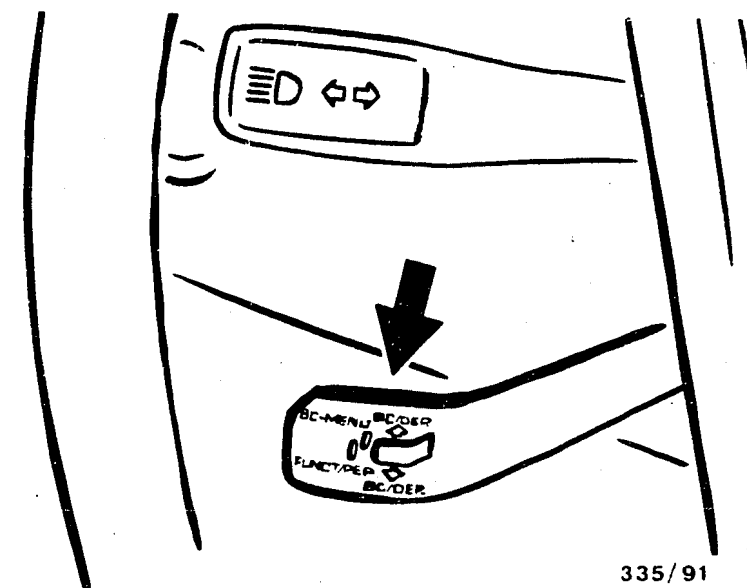
Is set value attained?

N>

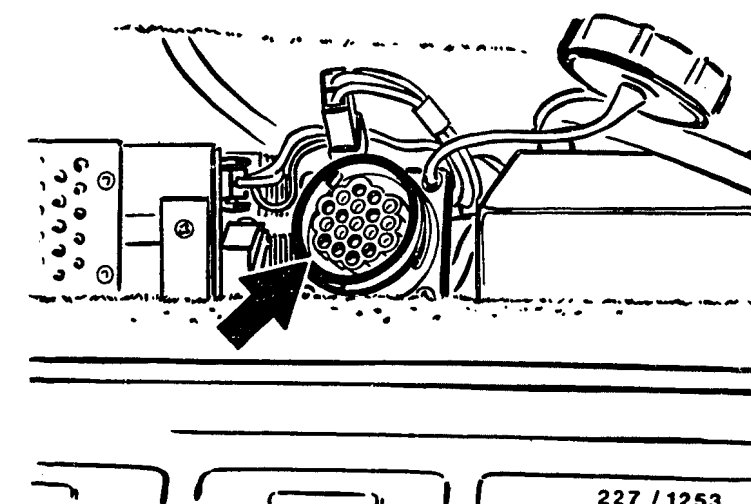
Trouble-shooting, warning lamp

1. Warning lamp ON:
Value greater than 3
 - * Short to positive on lead from warning lamp to U Bat
 - * Warning lamp defective (short circuit).
2. Warning lamp OFF:
Value less than 250
 - * Open circuit in lead from warning lamp to U Bat
 - * Warning lamp defective (open circuit)

Replace defective warning lamp and check function of RKS-G.



335/91



227 / 1253

Continued on next picture page

C09

<=>

C10

<=>

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (10)

Fault code 18/100
18/ 36

N>

Check serial interface:

Check whether instrument cluster voltage is being applied to control-unit plug term. 1 and term. 2.

Set value approx. U Bat

Is set value attained?

Trouble-shooting, serial interface

1. Use ohmmeter to check following leads for open circuit.

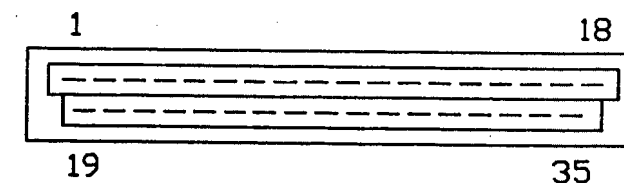
* From control-unit plug term. 1 to instrument-cluster plug 2 term. 11.

* From control-unit plug term. 2 to instrument-cluster plug 2 term. 10.

2. Instrument cluster defective

Replace defective leads or renew instrument cluster.

Test RKS-G following elimination of fault.



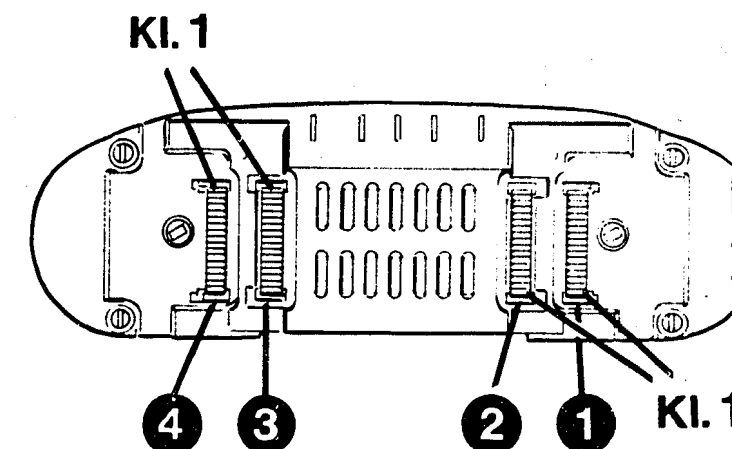
265/430

Top view of 35-pole control-unit plug.

Back of instrument cluster

1...4 Numbering of plug connections

Term. 1 Start of plug assignment



335/93

Continued on next picture page

C11

<=>

C12

<=>

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (11)

V

Faultcode 19/ 00

Check battery voltage:

Switch on ignition

Check whether U Bat
applied to control-unit
plug term. 33.

Set value U Bat

Is set value attained?

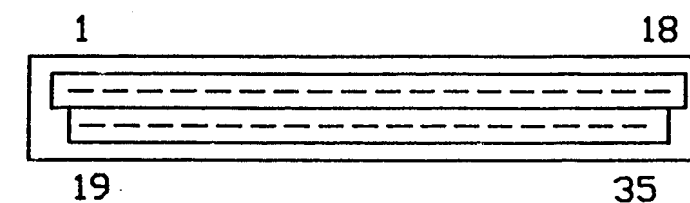
N>

Trouble-shooting U Bat

1. Use ohmmeter to check
lead from control-unit plug
term. 33 via fuse to
term. 15 for open circuit.

Replace defective lead or
eliminate open circuit.

Test RKS-G following
elimination of fault.



265/430

Top view of 35-pole
control-unit plug.

INDEX

Battery voltage, testing	C13
High-frequency sensor FL	B25
High-frequency sensor FR	B27
High-frequency sensor RL	B21
High-frequency sensor RR	B23
Serial interface	C11
Warning lamp	C09
Wheel-speed sensor FL	C05
Wheel-speed sensor FR	C07
Wheel-speed sensor RL	C01
Wheel-speed sensor RR	C03

For production reasons:
continued on the following
coordinate.

TABLE OF CONTENTS

Section	Coordinate
Structure of this microcard.....	A01
How to use this microcard.....	A02
Special features.....	A03
Safety and precautionary measures.....	A08
Testers and tools.....	A10
Installation position of components.....	A11
How to use trouble-shooting chart and trouble-shooting program.....	B01
Test prerequisites.....	B03
Trouble-shooting chart.....	B04
How to use self-diagnosis, self-diagnosis test table and self-diagnosis trouble-shooting program..	B05
Activation of self-diagnosis	B07
Self-diagnosis test table.....	B15
Self-diagnosis trouble-shooting program.....	B21
Index.....	N25

PUBLICATION INFORMATION

(c) 1989 ROBERT BOSCH GmbH Automotive Equipment -
After-Sales Service, Department of Technical
Publications KH/VDT, Postfach 10 60 50,
D-7000 Stuttgart 10.
Published by: After-Sales Service Department for Training
and Technology (KH/VSK).
Press date 10.1989.
Please direct questions and comments concerning the
contents to our authorized representative in your country.
This publication is only for the use of the Bosch After-
Sales Service Organization and may not be passed on to
third parties.

Microfilmed in the Federal Republic of Germany.
Microphotographié en République Fédérale d'Allemagne.